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THIS MONTH:                     *
*                               *
*    - The Limits Of Computer   *
*      Intelligence-Dr. L. Dreger *
*    - Rudy's SQ Notes          *
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*                               *
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*  NEXT MEETING DATE: 10/03/90  *
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*                               *
*   Send all contributions by the *
*   3rd Wednesday of the month to: *
*                               *
*     Bill Heberlein            *
*     Editor                    *
*     SMUG BYTES                *
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*     Milwaukee WI 53225        *
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*Book      - D. Nickel                  *
*   1 - 284 9691                        *
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* - Sub Group Leaders                   *
*"C"       - R. Cultice                 *
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*      - 542 3591                       *
*Games     - N. Schultz                 *
*Meeting 3rd Saturday of the month*     *
*      - 353 4522                       *
*Hardware  - G. Kraemer                 *
*Meet-no set date. Call for info.       *
*      - 421 0179                       *
*QL        - R. Hilsmann                *
*Meeting 3rd Wednesday of month         *
*      - 251 5291                       *
*Spectrum  - R. Hilsmann                *
*Meeting 3rd Wednesday of month         *
*      - 251 5291                       *
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The Limits Of Computer Intelligence
by Dr. Lloyd Dreger

Editors note: This is the talk Dr. Dreger gave at the '90 Expo. Also because of the length of the article it will run in the next four issues of SMUG Bytes.

Computers are having a bigger and bigger impact on our lives as programs become smarter. However, up to the present time, no computer is any smarter than the person who programmed it. It is the hope of strong Artificial Intelligence (AI) that computers will someday be able to transcend this limit and think thoughts that were not programmed into it by its programmer. This idea is also the fear of some people. What follows is taken from Searle, George, Churchland, Penrose, and Changeux (as listed in the Bibliography) along with some original ideas.

Proposition 1. Computers and their programs are formal (syntatic). This is quite is quite uniformly accepted as true. A program is an algorithm-- a procedure for manipulating date. Data can be digitial or analog. Computers by following a procedure called "add" can add two meaningless symbols called numbers and come up with a new meaningless symbol. A computer adds without knowing it is adding.

Computers can perform syntatical proceedures faster and more accurately than humans. They literally can keep track of thousands of things without getting confused. But, if we had the same "check list" that we give a computer and used a "parity bit" to check for accuracy we can do the same thing that the computer does albeit not as rapidly. Our speed would be improved if we didn't get interrupted all the time.

The game of chess is played by strictly syntactical rules. The moves for a piece are set.

"SQ" NOTES
BY R.A.HILSMANN

Do you have a QL? Ever had Keyboard problems? Certain keys won't work any more?

About six weeks ago, at our monthly Sinclair/QL meeting, one of our members dropped in with his QL under his arm. Some of the keys did not put characters on the screen! Dead keys! Since I had a similar problem with my keyboard some time ago (Control key didn't work), and I was able to fix the broken trace in the membrane, he thought I would be more knowledgeable about fixing such a problem. After inspection of his keyboard membrane on his QL, I found a totally different problem, but more about his keyboard problems later. Let me first talk about how I had taken care of my keyboard problem.

As usual, the most difficult item when fixing electronic devices, or any other problems for that matter, is to find what and where it is broken!

If only one, or a few keys on your keyboard do not work, chances are one of the circuit traces, either on one of the ribbon cables, or on one of the membrane halves is at fault.

A problem one encounters with the QL keyboard membrane is, that all of the traces are on the inside, sandwiched between three layers of plastic. Yes three layers, the two outside layers have the circuit traces printed on them with conductive paint, the one in the center keeps the two layers apart so that the traces do not touch. There are large holes in the center layer, which are located under the keys, so that when a key is pressed the traces make contact. All this is, unfortunately, held together with a rather nasty adhesive

Using the probes on an Ohm Meter (VOM) direct is therefore not possible, but since this is about the only way to find a broken circuit-trace, the problem seems to be insurmountable. Not quite, attach another type of probe to your VOM probes (but do not blame me for any injuries, fumble fingers!!!).

Using jumper wires, attach a single edge razor blade (new & sharp) to one of the probes on your VOM, clip the other probe, using a jumper wire, to the suspected trace on the exposed end of one of the ribbon cables making sure you make contact with the conductive coating.

While following the trace from the ribbon cable, use the tip of the razor blade gently to pierce through the plastic into the conductive coating (circuit trace), but be sure to hold the razor blade in line with the trace, not across, otherwise you would surely cut the trace. You also do not have to use a large amount of pressure, all the tip of the razor blade has to do is, to touch the trace coating on the other side of the plastic sheet! While keeping your eye on your Ohm meter when using the blade, you should be able to see when you get a reading, this will give you an idea of how deep to press the razor blade tip through the plastic.

If you now follow the suspected trace, inserting the blade a few inches at a time along the trace, you should be able to find the section where the break happened, working your way back till you get a reading again will give you an even better idea where the precise spot of the break is located. Now to the really tricky part, fixing the break!!

It has been suggested (and practiced, as I heard), to scrape away the plastic layer till you expose the conductive coating, but to me this is like trying to touch up a coat of paint by shaving away the layer of wood the paint sticks too.

I had fixed my keyboard membrane

by cutting a section out of the other membrane half, the one opposite from the one having the broken trace, and precisely opposite from the break. This of course is only possible if there are no traces right across from the damaged section.

Using a razor blade, I made a cut next to, and following the trace, not deep enough to penetrate both membrane halves, and just long enough to get the tip of a knife wedged under the top two layers. Inserting a tip of a dull knife into the cut, I separated the top two layers from the one having the bad circuit trace on it. Lifting the two top layers, I now cut an about half inch section out of those two top layers, just wide enough to expose the circuit trace to be fixed, without damaging the half holding the broken trace.

The next step was to remove the adhesive from the broken trace, this can be accomplished by carefully scraping the adhesive away, do not use solvents since solvents would also remove the trace coating which you still need to fix the break.

I now cut a narrow strip of aluminum foil, just as wide as the trace itself. Using conductive paint, I now glued the strip of aluminum onto the broken trace, bridging the damaged section. After checking the repaired section for continuity with an ohm meter, a strip of clear adhesive tape, after the paint had dried, was used to cover the hole again.

My friends problem with his QL keyboard membrane was quite different, his (and later on mine, and others) keyboard membrane had a break right across the area where the ribbons turn into the membrane layer. Both, the ribbon cable, and the membrane halves are made out of one sheet of plastic. The problem in this case was that the adhesive, which naturally contains some sort of solvent, had removed all, or most

of the plasticizer out of the plastic membrane (plasticizer is the compound that keeps plastic flexible), making it brittle right on the edge where the ribbon continuous into the membrane layer.

Since this area has a sharp bend in it, and the slight flexing of the membrane when a key is pressed, together with the heat generated in the computer itself, results in this section to develop tiny cracks right across all the traces coming from the ribbon section.

In my friends case the breaks had gone already all across the two ribbons, and there was nothing I could do to save it. Seeing this, I now inspected my ribbons and found the cracks just beginning on the outer edge, using some conductive paint and lots of tape I now have the ribbons secured to the metal plate, which hold the membrane to the keyboard, preventing all flexing, and reenforcing the area under stress.

Since this episode I have seen three more QL's with similar keyboard problems. All I can say is, be aware! Of course it would be a good idea to keep an extra membrane on hand, there are also new types of membranes offered today which probably will not have similar problems in the future. Frank Davis, the new publisher of '2068 UP DATE', has a bunch of them on order, and for under $20, they may prove to be a good investment. This of course is also an easier way to fix broken traces!

Well this should do it for this month, hopefully my QL will hold out for the next few issues of SMUG BYTES, I had a bit of a problem for a few issues (see above).

Good Luck, 'till next month...
Rudy

Ps: The next page is a subscrip-tion / renewal form for the....
2068 UPDATE MAGAZINE
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5. IF QL PLEASE CHECK: ___TRUMP ___SANDY ___CST ___UNEXPANDED QL
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PRESIDENTS PROGRAM

There have been quite a few members asking for keyboard membranes to replace theirs. It seems there has been a rash of membrane failures to their QL's. Well SMUG is going to do a group buy. If anyone needs a keyboard replacement please contact Rudy or me. We may be able to get a better price with a larger purchase.

GIGO
Or In Otherwords
The Meeting

The last meeting of summer and the meeting went well. We discussed some mail the club received and who is going to answer them. Well Lloyd is our man. He is answering the mail and if he asks you a question please help him out. Also it appears that a member has a desk top copier he is willing to sell to the club. We have agreed to purchase it as the price is right. Well come to the next meeting we need your input and maybe you can bring your computer. Well see you there.

AI Continued

Each piece is given a value which may change as the end game is approached. The goals are set (checkmate, stalemate or trade for equal or higher valued pieces). Strategy is based on If-Then branching statements and the ability to plan ahead. Computers used to fall prey to the sacrafice ploy as their memory and processing speed limited their ability to see ahead. As memory and speed increased, the ability to see ahead increased so a computer which can see from the offer of a piece can now see the capture of its higher valued piece and thus avoid the gambit. Human minds can be overloaded. The best Grand Master can only plan ahead 8 to 10 moves and should be beaten by a computer that can see ahead 21 or more moves. But, can this super computer come up with a new better opening or better strategy? The answer has to be maybe but it's by accident not by plan and the computer will never recognize it as such.

Computers can also play 20 Questions as that game is based on tree branching where simple yes and no

answers determine which branch to take which question to ask next. Computers can also "learn" more questions and more answers by adding these to their data base of nonsense symbols as long as those branches are at the top of a branch. Growing new branches off of already existing is a lot more difficult.

Computers also can play trivial pursuit as that game is based on the instant recall of facts (better known as rote memory and unless frequently used they soon fade. Computers need the techniques of library research called keywords to play trivial pursuit for searches in its database. If a properly keyworded question is used on a properly keyworded database of sufficient size the computer can out perform any mind as every mind tends to have faulty recall.Computers

don't forget unless they have power failure (which is equivalent to death in a brain). Any similarity to the computer languages of LISP and PROLOG is very intentional. There is absolutely no cognition or understanding necessary. The computer is still only sorting its meaningless symbols.
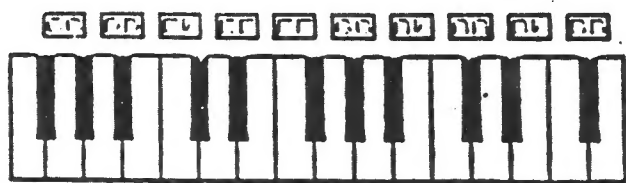
Smart programs can do medical and psychological diagnosis and may seem intelligent. However, these programs never go off on their own and ask questions not in the algorithm, i.e., not thought of by the programmer and thus do not do original thinking. Some of these programs can even handle what is called fuzzy logic -- not just yes and no answers to questions. This weighted logic is put there by the programmer and must be thoroughly tested and adjusted before being used.

What about algorithms that write algorithms? Computers are used to design new computers. What they usually do is help the designer keep track of everything he has to keep track of which means that it has a list of necessary things the programmer had to put there in the first place. Designing electrical circuits follows Kirkoff's rules. Certain types of circuits require certain elements. All this can be specified. The same with algorithms. The pieces of the algorithm must be in the program or at least recallable from a database.

Proposition 2. Human minds can be formal (syntatic) and have mental content (semantic). Many operations of the mind, especially in the fields of mathematics and logic, **can be** strictly syntatic. Rote memory of one plus one equals two can be wholly syntatic requiring no concept of the meaning of a number or of addition. Note the **can be**. Once the human mind thinks of it as syntatic and semantic. Semantics implies cognition and understanding.

Turing Test: If a computer can perform in such a way that an expert cannot distinguish its performance from that of a human who has a certain congnitive ability, then the computer also has that ability. This test is presently applied as proof of cognitive ability. "The number you have reached etc." meets this test but, be certain, the computer doesn't understand a word it is uttering. Tape recorders playing a tape utter the attributes of human intelligence (speech), but certainly don't understand (cognition). Limited testing with the Turing test can lead to erroneous results. Only exhaustive testing will allow the Turing test to be an adequate test of cognition. Humans can also fail exhaustive Turing testing. Children can recite nursary rhymes without comprehending what they mean. We can all say,

supercalifragilisticexpelidocious"
but does anyone know what it means or
is it just nonsense? IF, GO TO, READ
are commands for a computer following
strict syntax, no further cognition
required. Perhaps a stricter rule for
cognition should be applied. Why not
the same one every child must pass in
the classroom, "In your own words,
what is the meaning of ____." I'm
going to cut you short at the bridge
- looking up the meaning of a word
and then reciting the meanings of the
words found there or however many
iterations you want to take also
doesn't count. Having the attributes
of intelligence does not imply
cognition or understanding.

The 5th Wave

Re·al Pro·gram·mers
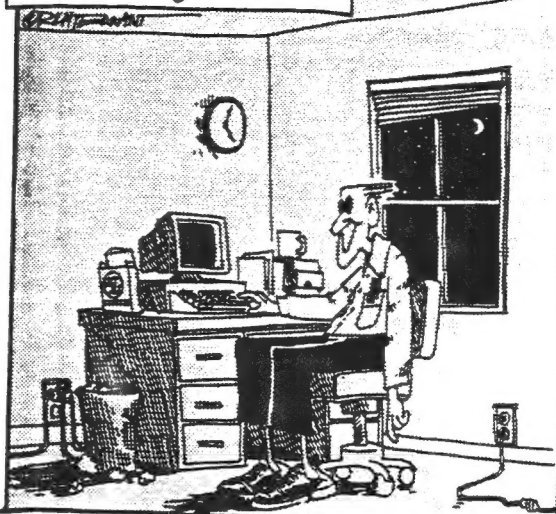
Real Programmers don't sleep - their systems just temporarily go down.

# The Sinclair Milwaukee Users Group
(SMUG)

We are a not-for-profit group devoted to serving the interests of those who own, use, and/or are interested in the Timex/Sinclair family of computers.

Editor and contact person is:
 Bill Heberlein (414) 527 2191.

SMUG maintains a gratis exchange of newsletters with approximately 30 Users Groups across the U.S. and Canada. Clubs not sending newsletters for more than 6 months are removed from our mailing list.

Newsletter subscription is available for only $10 per year to non members or free with a club membership. A club membership is $20 per year for a family membership.

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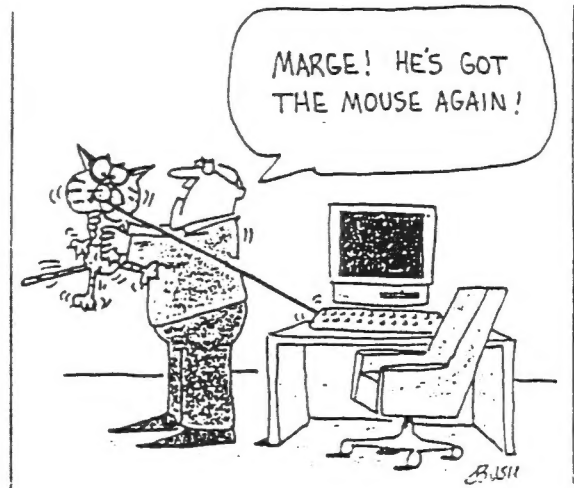
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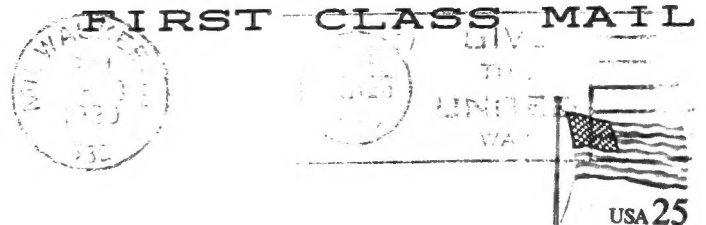
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The next meeting of SMUG will be held on:
Wednesday, October 3,1990

Location:
Equitable Savings and Loan,
145th and Capital Drive,
Milwaukee

6pm Set Up
6:30 Demo Of New QL Programs
7:30 Business Meeting
8:30 Who Can Show What They'r Doing
9:00 Demo Of QL Database
10:30 Clean Up